Application No. 10/781,226 GG01

AMENDMENTS TO THE SPECIFICATION:

Please replace paragraph 9 beginning on page 3 with the following paragraph:

[0009] A first aspect of the invention is directed to a method for treating one or more articles with a downstream plasma generated from dissociating one or more gases. The method includes supplying one or more gases from a source to a first chamber, including a means for controlling expansion of a plasma back through the source from the first chamber, applying RF power to dissociate one or more gases and create plasma having a power density, withdrawing one or more dissociated gases from the first chamber through a constriction sized to increase a the power density of the plasma, and supplying one or more dissociated gases to a second chamber containing one or more articles.

Please replace paragraph 10 beginning on page 3 with the following paragraph:

[0010] A second aspect of the invention is directed to a method for treating one or more articles with a downstream plasma generated by dissociating one or more gases. The method includes supplying one or more gases from a first source to a first chamber, applying RF power to dissociate one or more gases in the first source and create a first plasma having a first power density, withdrawing the first plasma from the first chamber through a first constriction to increase the first power density of the first plasma, supplying one or more gases from a second source to a second chamber for RF power to dissociate one or more gases from the second source to create a second plasma having a second power density, using a second constriction to withdraw the second plasma one or more gases from the second chamber to increase the second power density of the second plasma, and supplying the first plasma from the first chamber and the second plasma from the second chamber to a third chamber containing one or more articles.

Please replace paragraph 11 beginning on page 3 with the following paragraph:

[0011] A third aspect of the invention is directed to an apparatus to dissociate one or more gases to produce a downstream plasma. The apparatus includes a first chamber with a first constriction, coupled to a first source of one or more gases, including a means for controlling expansion of a plasma in the first chamber back through the first port; one or more RF energy sources coupled to the first chamber; means for dissociating the one or more gases in the first chamber into a plasma having a power density, wherein the constriction increases the power density of the plasma; and a second chamber coupled to the first chamber, wherein the second chamber can contains one or more articles.

Please replace paragraph 12 beginning on page 4 with the following paragraph:

[0012] A fourth aspect of the invention is directed to an apparatus to dissociate one or more gases to produce a downstream plasma. The apparatus includes a first chamber with a first constriction, coupled to a first source of one or more gases; a second chamber with a second constriction, coupled to a second source of one or more gases; one or more RF energy sources coupled to the first chamber and the second chamber; means for dissociating the one or more gases from the first port into a first plasma having a first power density in the first chamber, wherein the first constriction increases the first power density, and means for dissociating one or more gases from the second port into a second plasma having a second power density in the second chamber, wherein the second constriction increases the second power density; and a third chamber coupled to the first chamber and the second chamber, wherein the third chamber can contains one or more articles.

Please replace paragraph 33 beginning on page 7 with the following paragraph:

[0033] In FIG. 1A, one embodiment of the invention includes a gas inlet 120 which supplies one or more gases to discharge chamber 111. Discharge chamber 111 also has a capillary tube 110 to prevent plasma expansion into gas inlet 120. One or more radio-frequency (RF) energy sources 170 are coupled to inductor 115, which surrounds discharge chamber 111 and dissociates one or more gases passing through discharge chamber 111, which may be made of various

materials (e.g., a dielectric material or an equivalent). Discharge chamber 111 is coupled to a second chamber (not shown) by output port 114. Discharge chamber 111 is coupled to output port 114 by constriction 118 to achieve a high power density. In accordance with one embodiment of the invention, constriction 118 has a diameter that is a function of the power density required, and the total gas flow required to obtain the desired reaction rate (e.g., ashing, cleaning, sterilization, surface modification, and other equivalent plasma processes). In alternative embodiments of the invention, one or more constrictions 118 can be used for the same chamber, each having an inside diameter ranging from one millimeter (mm) to less than 19 millimeters, and a length substantially equal to or greater than one millimeter. In one embodiment, an insert as simple as a cylindrical disk with one or more holes drilled parallel to its cylindrical axis can provide one or more constrictions. Alternative embodiments have multiple inserts.

Please replace paragraph 44 beginning on page 12 with the following paragraph:

[0044] In operation, a gas (e.g., an oxygen-based or halogen-based gas, or an equivalent gas) is supplied to discharge chamber 111 from a suitable source (not shown) and discharge chambers 111 and 311 are optionally supplied with one or more other gases from a suitable source (not shown). The flow of gases in each discharge chamber is limited by the size of the constriction and the need to maintain a pressure of few tenths of a Torr to few tens of Torrs. When one discharge chamber alone cannot handle the total flow required then additional discharge chambers are placed in parallel to satisfy the ~~preceeding~~ preceding requirement. The composition of the one or more gases can be changed while keeping the total flow constant. A mixture of 1 percent to 99 percent of an oxygen-based, a halogen-based gas, or an equivalent gas can be appropriate for various applications of alternative embodiments of the invention.